

早稲田大学大学院 経済学研究科

博士論文概要書

Rationality, information, and opportunity

合理性、情報と機会

シン タン

Dan QIN

経済政策専攻 経済政策理論専修

2015年7月

This dissertation studies several topics closely related to the informational basis of decision-making. Any individual and social evaluation uses some types of information and ignores others. To some extent, the informational basis differentiates one decision procedure to another. Relevant information can be classified into consequentialist information and non-consequentialist information. The former can then be classified into Welfaristic information and Non-Welfaristic information. In Arrovian social choice framework, although non-consequentialist and Non-Welfaristic information are not excluded *a priori*, one cannot explicitly incorporate that information without modifying the framework. In fact, informational basis in Arrovian social choice is more restrictive. First, following the Robbinsian criticism (Robbins 1935) of cardinal and interpersonally comparable utilities, only ordinal and interpersonally non-comparable preference information can be used. Second, Arrow independence itself puts further restriction on the informational basis. The latter is our first topic in the dissertation.

After a general introduction of chapter 1, we start by examining independence conditions in Arrovian social choice framework in chapter 2. This analysis is divided into two parts, depending on the interpretation of Independence of Irrelevant Alternatives (IIA). The first part studies the possibility of relaxing IIA while keeping the self-dependent spirit. In this part, we provide a generalized characterization of the family of independence conditions that are equivalent to independence of irrelevant alternatives by proposing a pair-based refinement of *S*-independence. Equipped with the new result, the relation between external independence conditions and independence of irrelevant alternatives is explored. This part of the dissertation is based on the following publication:

Qin, D. (2014). On *S*-independence and Hansson's external independence. *Theory and Decision*, forthcoming.

In the second part of chapter 2, we examine the possibility of relaxing IIA without the self-dependent spirit. To achieve this objective, we refine the information function method, which is a powerful tool for analyzing the information requirements of social welfare functions. We observe that the original information function provides only a coarse description of information structure. Therefore, we propose a refinement of this method by changing the range of the information function. We also analyze the role of partially relevant information in preference aggregation through an application of the refined version of the information function method. This part of the dissertation is based on the following publication:

Qin D. (2014) "Refining the information function method: Instrument and application" *The Czech Economic Review* 8 (2), 84-101

In chapter 3, we examine the implication of allowing individual to violate full rationality in collective decision making. In particular, this chapter discusses the possibility of aggregating quasi-transitive preferences in the Arrovian framework. In

light of Aizerman and Malishevski's (1981) representation theory, expanding the domain to quasi-transitive preferences is equivalent to strengthening the independence condition. We explore the consequence of such restriction on informational basis. Further, our analysis shows that the strengthened independence condition implies neutrality, which can shed further light on the relation between independence conditions and Welfarism. This part of the dissertation is an outgrowth of the following publication:

Qin, D. (2014). Aggregating quasi-transitive preferences: a note. *Economics Bulletin*, 34(2), 976-983.

In chapter 4, we characterize a form of consequentialism. We study the evaluation of opportunity sets via instrumentalist (consequentialist) logic. This chapter is divided into two parts. In the first part, we study rankings over opportunity sets. A ranking over opportunity sets is justifiable if there exists a binary relation on the set of alternatives, such that one opportunity set is at least as good as the second, if and only if there exists at least one alternative in the first set which is at least as good as any alternative of the two sets combined. We characterize (reflexive and complete) opportunity sets rankings that can be justified by acyclic binary relations – the broadest possible class of justifiable rankings. This part of the dissertation is an outgrowth of the following publication:

Qin, D. (2014). A note on justifiable preferences over opportunity sets. *Economics Bulletin*, 34(3), 1961-1967.

In the second part of chapter 4, we turn to choice functions over opportunity sets. A choice function over opportunity sets is justifiable if there exists a choice function over alternatives such that an opportunity set (menu) is chosen from a collection of menus if and only if the former contains alternatives that reach the highest instrumentalist value, in terms of the choice function over alternatives, of all menus combined. We explore necessary and sufficient conditions for justifiable choice functions by general choice functions, Chernoff consistent choice functions, and path-independent choice functions. This section also considers the condition under which the underlying choice functions are binary, which leads to characterizations for binary-justifiability by acyclic, quasi-transitive, and transitive preferences. Finally, we connect the results in this chapter by bridging two formulations of consequentialism. This part is based on the following publication:

Qin, D. (2015). On justifiable choice functions over opportunity sets. *Social Choice and Welfare*, forthcoming.

Chapter 5 summarizes our study.